

**CLAIMS**

1  
2 1. A method of incrementally updating precision and recall curves in a k nearest  
3 neighbor database, said database including original documents, categories, category  
4 assignments for the original documents, and category scores for the original  
5 documents, the method including:

6 retaining for the original documents a list of their m nearest neighbors and  
7 corresponding similarity scores, wherein  $m > k$ ;

8 adding or deleting one or more original documents and their category  
9 assignments;

10 identifying the documents influenced by the adding or deleting;

11 updating one or more category scores of the influenced documents; and

12 computing precision and recall curves for the categories having updated category  
13 scores.

1 2. A method of incrementally updating precision and recall curves in a k nearest  
2 neighbor database, said database including original documents, categories, category  
3 assignments for the original documents, and category scores for the original  
4 documents, the method including:

5 retaining for the original documents a list of their m nearest neighbors and  
6 corresponding similarity scores, wherein  $m > k$ ;

7 adding or deleting one or more category assignments to one or more original  
8 documents;

9 updating category scores of the documents influenced by the adding or deleting  
10 of one or more category assignments, for at least the categories to which the  
11 category assignments were added or deleted; and

12 computing precision and recall curves for the categories having updated category  
13 scores.

1        3. A method of incrementally adding category assignments to particular original  
2 documents in a k nearest neighbor database, said database including original  
3 documents, categories, category assignments for the original documents, and category  
4 scores for the original documents, the method including:

5        retaining for the original documents a first list of their k nearest neighbors and  
6        corresponding similarity scores;

7        retaining for the original documents a second list of m-k additional nearest  
8        neighbors and corresponding similarity scores;

9        adding one or more category assignments for one or more particular original  
10       documents;

11       computing category scores for the particular original documents and a  
12       predetermined number of nearest neighbors of the particular original documents,  
13       for those categories to which the category assignments are added, based on the  
14       retained similarity scores; and

15       computing precision and recall curves for the categories to which the category  
16       assignments are added.

1        4. A method of incrementally adding one or more documents to a k nearest  
2 neighbor database, said database including original documents, categories, category  
3 assignments for the original documents, and category scores for the original  
4 documents, the method including:

5        retaining for the original documents a first list of their k nearest neighbors and  
6        corresponding similarity scores;

7        retaining for the original documents a second list of m-k additional nearest  
8        neighbors and corresponding similarity scores;

9        adding one or more documents;

10       calculating similarity scores between the added documents, and the added and  
11       original documents;

12 modifying the retained first and second nearest neighbor lists for a predetermined  
13 number of nearest neighbors of the added documents;  
14 adding category assignments for the added documents;  
15 computing one or more category scores for the added documents and the  
16 predetermined number of nearest neighbors of the added documents, based on the  
17 retained and calculated similarity scores; and  
18 computing precision and recall curves for the categories to which the category  
19 assignments are added.

1 5. A method of incrementally deleting category assignments from particular  
2 documents in a k nearest neighbor database, said database including original  
3 documents, categories, category assignments for the original documents, and category  
4 scores for the original documents, the method including:

5 retaining for the original documents a first list of their k nearest neighbors and  
6 corresponding similarity scores;

7 retaining for the original documents a second list of m-k additional nearest  
8 neighbors and corresponding similarity scores;

9 deleting one or more of the category assignments for one or more particular  
10 original documents;

11 computing category scores for the particular original documents and a  
12 predetermined number of nearest neighbors of the particular original documents,  
13 for those categories from which the category assignments are deleted, based on  
14 the retained similarity scores; and

15 computing precision and recall curves for the categories from which the category  
16 assignments are deleted.

1 6. A method of incrementally deleting documents from a k nearest neighbor  
2 database, said database including original documents, categories, category  
3 assignments for the original documents, and category scores for the original  
4 documents, the method including:

5 retaining for the original documents a first list of their k nearest neighbors and  
6 corresponding similarity scores;

7 retaining for the original documents a second list of m-k additional nearest  
8 neighbors and corresponding similarity scores;

9 deleting one or more of the original documents and corresponding category  
10 assignments from the database;

11 deleting the deleted documents from the retained first and second nearest  
12 neighbor lists for a predetermined number of nearest neighbors of the deleted  
13 documents;

14 computing one or more category scores for a predetermined number of nearest  
15 neighbors of the deleted documents, based on the retained similarity scores; and

16 computing precision and recall curves for the categories in which the deleted  
17 documents had category assignments.

1 7. A method of incrementally adding category assignments to particular original  
2 documents in a k nearest neighbor database, said database including original  
3 documents, categories, category assignments for the original documents, and category  
4 scores for the original documents, the method including:

5 retaining for the original documents a first list of their k nearest neighbors and  
6 corresponding similarity scores;

7 creating an influence list of original documents having a particular original  
8 document among their k nearest neighbors;

9 adding one or more category assignments for one or more particular original  
10 documents;

11 identifying influenced original documents from the influence list for the  
12 particular original documents to which the category assignments are added;

13 computing category scores of the influenced original documents and of the  
 14 particular original documents, for those categories to which the category  
 15 assignments are added, based on the retained similarity scores; and  
 16 computing precision and recall curves for the categories to which the category  
 17 assignments are added.

1 8. A method of incrementally adding one or more documents to a k nearest  
 2 neighbor database, said database including original documents, categories, category  
 3 assignments for the original documents, and category scores for the original  
 4 documents, the method including:

5 retaining for the original documents a first list of their k nearest neighbors and  
 6 corresponding similarity scores;

7 creating an influence list of those original documents having certain original  
 8 documents among their k nearest neighbors;

9 adding one or more documents to the database;

10 calculating similarity scores between the added documents, and the added and  
 11 original documents;

12 updating the retained first list of k nearest neighbors to include the added  
 13 documents;

14 updating the influence list to include the added documents;

15 adding category assignments for the added documents;

16 computing one or more category scores of the added and original documents  
 17 influenced by the category assignments, based on the retained and calculated  
 18 similarity scores; and

19 computing precision and recall curves for the categories to which the category  
 20 assignments are added.

1 9. A method of incrementally deleting category assignments from particular  
 2 documents in a k nearest neighbor database, said database including original

documents, categories, category assignments for the original documents, and category scores for the original documents, the method including:

retaining for the original documents a first list of their k nearest neighbors and corresponding similarity scores;

creating an influence list of those original documents having certain original documents among their k nearest neighbors;

deleting one or more category assignments for one or more particular original documents;

identifying influenced original documents from the influence list for the particular original documents from which the category assignments are deleted;

computing category scores of the influenced original documents and of the particular original documents for those categories from which the category assignments are deleted, based on the retained similarity scores; and

computing precision and recall curves for the categories from which the category assignments are deleted.

10. A method of incrementally deleting one or more documents to a k nearest neighbor database, said database including original documents, categories, category assignments for the original documents, and category scores for the original documents, the method including:

retaining for the original documents a first list of their k nearest neighbors and corresponding similarity scores;

retaining for the original documents a second list of m-k additional nearest neighbors and corresponding similarity scores;

creating an influence list of those original documents having certain original documents among their k nearest neighbors;

deleting one or more documents from the database and corresponding category assignments;

- 13 updating the retained first and second lists of  $m$  nearest neighbors to delete the
- 14 deleted documents;
- 15 updating the influence list to delete the deleted documents;
- 16 computing one or more category scores of the original documents influenced by
- 17 the deleted documents, based on the retained similarity scores; and
- 18 computing precision and recall curves for the categories in which the deleted
- 19 documents had category assignments.

09093301 052701  
10/22/00 10:22:00